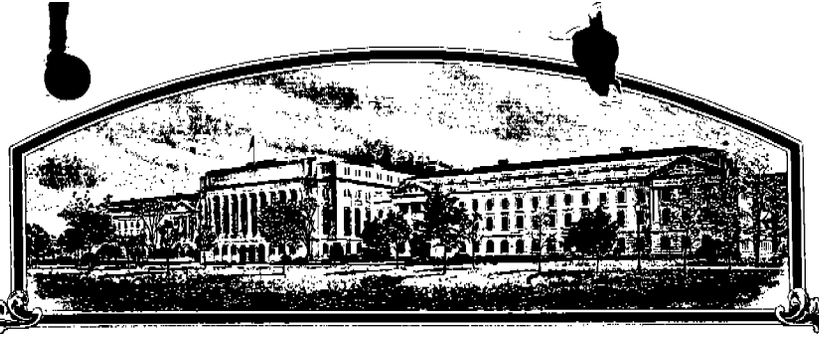


No. 76TQ009

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Sluis and Groot of America, Inc. and Leighton Sales Co.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF seventeen YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT ETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT T. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

PAK-CHOI

'Lei-Choi'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the City of* Washington *this* 28th *day of* December *in the year of our Lord one thousand nine hundred and* seventy-eight

Attest:

Commissioner
Plant Variety Protection Office
Grain Division
Agricultural Marketing Service

Secretary of Agriculture

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, POULTRY, GRAIN & SEED DIVISION

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

INSTRUCTIONS: *See Reverse.*

FORM APPROVED—
OMB NO. 40-R3822

No certificate for plant variety protection may be issued unless a completed application form has been received (5 U.S.C. 553).

1a. TEMPORARY DESIGNATION OF VARIETY	1b. VARIETY NAME	FOR OFFICIAL USE ONLY
Lei-Choi	Lei-CHoi	PV NUMBER 76TQ009
2. KIND NAME: Pak-Choi, Chinese Cabbage	3. GENUS AND SPECIES NAME: Brassica Chinensis	FILING DATE 8/13/76 — TIME 9:45 A.M. P.M.
4. FAMILY NAME (BOTANICAL): Cruciferae	5. DATE OF DETERMINATION: February 1, 1975	FEE RECEIVED $ 500.00 $ 250.00 — DATE 8-13-76 9-6-78

6. NAME OF APPLICANT(S)	7. ADDRESS *(Street and No. or R.F.D. No., City, State, and ZIP Code)*	8. TELEPHONE AREA CODE AND NUMBER
Sluis & Groot of America, Inc.	124 A Griffin St., Salinas, Ca. 93901	(408) 758-4644

9. IF THE NAMED APPLICANT IS NOT A PERSON, FORM OF ORGANIZATION: *(Corporation, partnership, association, etc.)*	10. IF INCORPORATED, GIVE STATE AND DATE OF INCORPORATION	11. DATE OF INCORPORATION
Corporation	Delaware	1942

12. NAME AND MAILING ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS:

Boonman, Case
124 A Griffin St. Salinas, California 93901

13. CHECK BOX BELOW FOR EACH ATTACHMENT SUBMITTED:

- [X] 13A. Exhibit A, Origin and Breeding History of the Variety *(See Section 52 of the Plant Variety Protection Act.)*
- [X] 13B. Exhibit B, Novelty Statement.
- [X] 13C. Exhibit C, Objective Description of the Variety *(Request form from Plant Variety Protection Office.)*
- [X] 13D. Exhibit D, Additional Description of the Variety.

14a. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? *(See Section 83(a). (If "Yes," answer 14B and 14C below.)* [ ] YES [X] NO

14b. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?	14c. IF "YES," TO 14B, HOW MANY GENERATIONS OF PRODUCTION BEYOND BREEDER SEED?
[ ] YES [X] NO	[ ] FOUNDATION [ ] REGISTERED [ ] CERTIFIED

15a. DID THE APPLICANT(S) FILE FOR PROTECTION OF THIS VARIETY IN OTHER COUNTRIES? [ ] YES [X] NO *(If "Yes," give name of countries and dates.)*

15b. HAVE RIGHTS BEEN GRANTED THIS VARIETY IN OTHER COUNTRIES? [ ] YES [X] NO *(If "Yes," give name of countries and dates.)*

16. DOES THE APPLICANT(S) AGREE TO THE PUBLICATION OF HIS/HER (THEIR) NAME(S) AND ADDRESS IN THE OFFICIAL JOURNAL? [X] YES [ ] NO

17. The applicant(s) declare(s) that a viable sample of basic seed of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

May 22, 1978
(DATE)

(SIGNATURE OF APPLICANT)

1

(DATE)

(SIGNATURE OF APPLICANT)

FORM GR-470 (1-78)

May 22, 1978

EXHIBIT 13 A

1. The germ plasm source was secured from an Oriental Gentleman, now deceased, in Salinas. This gentleman specialized in the production of Oriental Vegetables. This seed was, we presume, from the Chinese mainland as both the seed and the source were closely guarded during this man's lifetime.

2. Breeding procedures we used to come to a stable and consistant strain were:

   Roguing pressure
   Selfing
   Single plant selections

3. Varients

   Savoyed leaf (0.3%)
   Prostrate (0.25%)
   Light green leaf (0.7%)
   Bolting (4%)
   Green petiole (0.15%)

4. Stability

   We had about 25 trials in Salinas Valley under all kinds of conditions in 1975, '76, '77 and now in 1978. We were checking these plots every 5 days and were very satisfied with the results. It really showed that this strain is useable in every season, though the combination; long days and hot weather conditions show increased bolting. The statistical results shown on the following pages are all taken at the time that about 80% of the plants were ready for harvest. The rest of the plants were still too small to harvest.

A. February 1976 Average of 3 Fields.

Plot Size: Total of 600, 1000, and 800 plants

Early boltings	1 %
Savoyed leaf	0.5 %
Light green leaves	0.9 %
Green Petiole	0 %
Prostrate	0.2 %

May 1976 Average of 4 Fields.

Plot Size: Total of 200, 1500, 900 and 2000 plants

Early boltings	3 %
Savoyed leaf	0.6 %
Light green leaves	1.2 %
Green petiole	0.4 %
Prostrate	0.4 %

August 1976 Average of 2 Fields.

Plot Size: Total of 3000 and 1600 plants

Early boltings	8 %
Savoyed leaf	0.3 %
Light green leaves	1 %
Green petiole	0.7 %
Prostrate	0.7 %

February 1977 Average of 5 Fields.

Plot Size: Total of 200, 700, 850 , 300 and 1300 plants

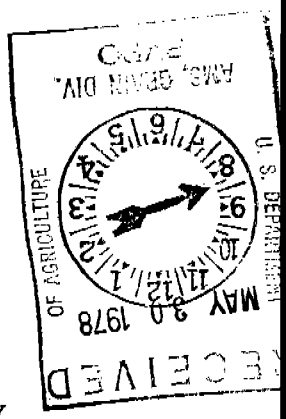
Early bolting	2 %
Savoyed leaf	0.4 %
Light green leaves	0.8 %
Green Petiole	0.1 %
Prostrate	0.1 %

INSTRUCTIONS

GENERAL: Send an original copy of the application and exhibits, at least 2,500 viable seeds, and $500 fee ($250 filing fee and $250 examination fee) to U.S. Dept. of Agriculture, Agricultural Marketing Service, Livestock, Poultry, Grain and Seed Division, Plant Variety Protection Office, National Agricultural Library Building, Beltsville, Maryland 20705. (See section 180.175 of the Regulations and Rules of Practice.) Retain one copy for your files. All items on the face of the form are self-explanatory unless noted below.

ITEM

5 Give the date the applicant determined that he had a new variety based on (1) the definition in section 41(a) of the Act and (2) the date a decision was made to increase the seed.



13a Give: (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method; (2) the details of subsequent stages of selection and multiplication; (3) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified and (4) evidence of uniformity and stability.

13b Give a summary statement of the variety's novelty. Clearly state how this novel variety may be distinguished from all other varieties in the same crop. If the new variety most closely resembles one or a group of related varieties: (1) identify these varieties and state all differences objectively; (2) attach statistical data for characters expressed numerically and demonstrate that these differences are significant; and (3) submit, if helpful, seed and plant specimens or photographs of seed and plant comparisons clearly indicating novelty.

13c Fill in the Exhibit C, Objective Description form, for all characteristics for which you have adequate data.

13d Describe any additional characteristics that are not described, or whose description cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the description of characteristics that are difficult to describe, such as, plant habit, plant color, disease resistance, etc.

14a If "YES" is specified (seed of this variety be sold by variety name only as a class of certified seed) the applicant may NOT reverse his affirmative decision after the variety has either been sold and so labeled, his decision published, or the certificate has been issued. However, if the applicant specified "NO," he may change his choice. (See section 180.16 of the Regulations and Rules of Practice.)

15a See section 42 of the Plant Variety Protection Act and section 180.7 of the Regulations and Rules of Practice.

April 1977 Average of 6 Fields.

Plot Size: Total of 150, 750, 900, 1400, 1400, and 1000 plants

Early bolting	2 %
Savoyed leaf	0.3 %
Light green leaves	0.1 %
Green petiole	0.1 %
Prostrate	0.2 %

September 1977 Average of 5 Fields.

Plot Size: Total of 200, 600, 400, 1000 and 300 plants

Early bolting	7 %
Savoyed leaf	0.3 %
Light green leaves	0.3 %
Green Petiole	0.3 %
Prostrate	0.1 %

May 1978 Average of 5 Fields.

Plot Size: Total of 1000, 1200, 1100, 3000 and 800 plants

Early bolting	3 %
Savoyed leaf	0.2 %
Light green leaves	0.3 %
Green Petiole	0.1 %
Prostrate	0 %

July 3, 1978 Exhibit B 1 of 780712

NOVELTY STATEMENT

Lei Choi is a white petioled dark green leaf-type Pak Choi. It is distinct from others of this type in that Lei Choi bolts about 14 days later in the Winter and Spring and 10 days later in the Summer and Fall.

EXHIBIT 13 ~~D~~ B 127 180712

The alternative strains referred hereto are marketed by Germains, Kitazawa Seed Co. and Toyoshima Seed Co. bearing no varietal name other than Pak Choi or Bok Choy and are either grown in the U.S. or imported. These strains are all highly variable as to color, height , savoyedness of leaf stem, size and bolting resistance. In selecting the Lei-Choi, the major pressure was placed on bolting, color, height and stem size.

We selected for optimum height and the largest stem with a pure white color while holding a dark green leaf. Bolting resistance was the most important characheristic we achieved.

SLUIS & GROOT OF AMERICA, INC.

WHOLESALE SEED GROWERS AND MERCHANTS

124-A GRIFFIN STREET, SALINAS, CALIFORNIA 93901

PHONE: (408) 758-4644 • TELEX No. 352-068 SLUIS GROOT SLI

June 23, 1978

Mr. Frey
United States Dept. of Agriculture
Ag. Marketing Service
Livestock, Poultry, Grain and Seed Div.
National Ag. Library Bldg.
Beltsville, Maryland 20705

Dear Mr. Frey;

Answering your question of June 7th about the novelty statement, I have to tell you that is not easy to say when Lei-Choi starts to bolt compared with the other varieties.

Since the variety is planted year round the problem is that day length and temperature change quite a lot. All Pak-Choi's will inevitably bolt, also Lei-Choi, but Lei-Choi will do that about 14 days later than other varieties in the Winter and Spring but only 10 days later in the Summer and Fall, due to the difference in day light and temperature.

Sincerely yours,

SLUIS & GROOT OF AMERICA, INC.

Mr. Case Boonman
General Manager

Cb/plr

7

SLUIS & GROOT OF AMERICA, INC.
P. O. BOX 580
MENLO PARK, CALIFORNIA 94025

November 16, 1976

Reference: Letter dated September 10, 1976 from Mr. T. E. Frey

EXHIBIT B

The alternative strains referred hereto are marketed under the varietal name Pak-choi or Bok-choy, and are either imported or grown in the U. S. These strains are all highly variable as to color, height, savoyedness of leaf stem size, and bolting resistance. The variations are from lot to lot as well as season to season, with the exception being that all exhibit a predisposition to bolt. In selecting Lei-choi, the major pressure was placed on bolting color, height, and stem size, with later pressure being placed on the leaf type. We selected for optimum height and the largest stems with a pure white color while holding a dark green leaf, with bolting resistance being the final criteria. Lastly, attention was directed toward the securance of a smooth leafed type.

EXHIBIT B

DATA INDICATIVE OF NOVELTY
PICTURES ALREADY IN YOUR POSSESSION

Photograph No.	
1	Lei-Choi - Standing alone - seeder in competative strain trial line.
2	Lei-Choi - Leaves held back to give better view of plant.
3	Lei-Choi - Black blocks on tape indicate 12 inches - plant is 20 inches tall.
4	Lei-Choi - Measuring the spread of the plant.
5	Lei-Choi - Center with varients in the selection on it and a competative selection on left.
6	Lei-Choi - A repeat of photograph 5 accentuating color differences.
7	Lei-Choi - Color range of leaves - lower right is example of preponderance of Lei-Choi leaves.
8	Lei-Choi - Color range of color of leaves - lower left is off color.
9	Lei-Choi - Repeat of Lei-Choi color range of leaves - upper left is off-color while lower right is correct.
10	Lei-Choi - Plant in later part of flowering.
11	Lei-Choi - Off-type - flowering.
12	Lei-Choi - Off-type top view - prostrate plant.
13	Lei-Choi - Off-type - sideview - prostrate plant.
14	Lei-Choi - Off-type - flowering.
15	Lei-Choi - Center foreground - competitive offerings background right side.
16	Lei-Choi - Center foreground - competitive offerings background and right side.

Seed Packed #1 enclosed.

May 22, 1978

Exhibit 13C

FORM GR-470-30
(7-1-74)

FORM APPROVED: OMB NO. 40-R3712

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
GRAIN DIVISION
HYATTSVILLE, MARYLAND 20782

OBJECTIVE DESCRIPTION OF VARIETY

CAULIFLOWER Pak-Choi
(Brassica oleracea var. botrytis) Brassica Chinensis

NAME OF APPLICANT(S)	VARIETY NAME OR TEMPORARY DESIGNATION
Sluis & Groot of America	Lei-Choi
ADDRESS (*Street and No., or F.F.D. No., City, State, and ZIP Code*)	FOR OFFICIAL USE ONLY
124 A Griffin St., Salinas, California 93901	PVPO NUMBER

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g. [0][8][9] or [0][9]) when number is either 99 or less or 9 or less.

1. REGION OF ADAPTATION: (Where best adapted in the U.S.A.)

[6] 1 = NORTHWEST 2 = NORTHCENTRAL 3 = NORTHEAST 4 = SOUTHEAST 5 = SOUTHWEST
6 = MOST REGIONS

2. SEASON: (Main crop)

[1,2,3,4] 1 = LATE FALL – EARLY WINTER 2 = LATE WINTER – EARLY SPRING
3 = LATE SPRING – EARLY SUMMER 4 = LATE SUMMER – EARLY FALL

3. MATURITY: (Days to 50% harvest)

[ ][ ][ ] FROM TRANSPLANTS N/A

[ ][ ][ ] FROM DIRECT SEEDING Average 55-95 days see attached page.

[1][4] NO. DAYS HARVESTING PERIOD

4. PLANT HEIGHT: (At harvest)

[3][0] CM. FROM SOIL LINE TO TOP OF CURD

[0][5] CM. TALLER THAN . . . . . [ ]

[ ][ ] CM. SHORTER THAN N/A . . . . . [ ]

1 = EARLY ERFURT 2 = SUPER SNOWBALL A
3 = SNOWBALL Y
4 = VEITCH AUTUMN GIANT
5 = OTHER (*Specify*) _____

5. LEAVES:

[4][0] TOTAL NUMBER
See Attached page.

[ ][ ] CM. AVERAGE LENGTH AT MID-POINT OF PLANT (*Including Petiole*) See Pictures.

[ ][ ] CM. AVERAGE WIDTH AT MID-POINT OF PLANT

[2] 1 = STRAIGHT MARGINS 2 = WAVY MARGINS

[ ] 1 = THIN VEINS 2 = THICK VEINS

[2] 1 = MOSTLY SESSILE 2 = MOSTLY PETIOLATE
3 = EQUALLY SESSILE AND PETIOLATE

[3] COLOR: 1 = LIGHT GREEN 2 = MEDIUM GREEN (*Snowball No. 10*)
3 = DARK GREEN (Lecerf Group) 4 = BLUSH GREEN (*November*)

[ ] 1 = UPRIGHT, EXPOSE CURD
2 = INCURVED, PARTIALLY COVER CURD
3 = COMPETELY COVER CURD (*Self blanching*)

6. CURD:

[ ][ ] CM. DIAMETER

[ ][ ] CM. DEPTH

EXHIBIT C

OBJECTIVE DECRIPTION

1. Region of Adaptation: Most regions.

2. Season: All seasons but with increased bolting during long days with extremely high temperatures.

3. Maturity: 55 to 95 days after emergence. Short day length and low temperatures increase number of days from emergence to market maturity.

4. Plant Height: 30 to 35 centimeters from soil line to top of center leaves. Approximately 5 centimeters taller than other lines of Pak-Choi. Plant width at mid-point is 15 to 26 centimeters.

5. Leaves: 36 to 40 leaves per plant.
Leaf petiole base 7 to 10 centimeters wide.
Petiole width at mide-point of plant is 3 to 4.5 cm.
Petiole width at base of leaf is 2.5 to 3 cm.
Margins slightly wavy, sessile.
Dark green color, thick veins.

6. Disease Resistance: Not tested.

7. Other Resistance: Bolting Resistance.

8. Indicate a variety that most closely remembles that submitted:
See Exhibit D and B.

May 22, 1978

EXHIBIT 13 B C- 184 780712

BOTANICAL DESCRIPTION

SEEDLING STAGE

Typical Cruciferae in first seeding stage exhibits good vigor and very rapid rate of growth.

MATURE PLANT (MARKET STAGE)

Erect white petioles with slight feathering, being broadly shingled at the butt and slightly tapering towards leaf base. Leaf is ovate dark green and white veined with slightly wavy margins.

Compared to the varieties which are on the market now, (see Page 2) this variety is much slower bolting and taller (see pictures), which increases yield considerably. The nice dark green leaf color and very white petioles improves appearance and marketability.

When we compared our variety with the Kitazawa variety, and the Toyoshima variety, both marketed under the name Pak-Choi, we came to the following statistical information:

Average of all trials in Salinas Valley 1976, 1977.

Check On: Early Bolting

Lei-Choi	1 %
Kitazawa	50 %
Toyoshima	74 %

Check On: Marketable Plants (Impossible to market a flowering plant !).

Variety	Marketable		Rest
Lei-Choi	80%	1% bolted.	19% too small and off types.
Kitazawa	14%	5% bolted.	36% too small and off types.
Toyoshima	10%	74% bolted.	16% too small and off types.

Check On: Off Types

Variety	Off Types
Lei Choi	1.5 %
Kitazawa	9 %
Toyoshima	5 %

Check On: Length

Measuring: Average length of plants in several plots in 1976 and 1977 at harvesting time of Lei Choi. Measured was the length of the plant not including the bolting part.

Variety	Length
Lei Choi	33 cm.
Kitazawa	24 cm.
Toyoshima	29 cm.

NOTE: Both other varieties matured along the same line as Lei Choi but started bolting in a very early stage which makes marketing of the plant a problem. This can be solved by harvesting selectively every day, but this is prohibitive in regards to cost and productivity.

Lei Choi has the big advantage thst it is resistant to early bolting which makes it possible for the grower to harvest ± 80 % of the field in one cut while increasing the yield with ± 300 %.

The difference is shown on picture #15

Middle Front: Lei Choi
Middle Back: Toyoshima
Right: Kitazawa

6. CURD:

[ ] 1 = TIGHT 2 = LOOSE

[ ] 1 = SMOOTH 2 = KNOBBY

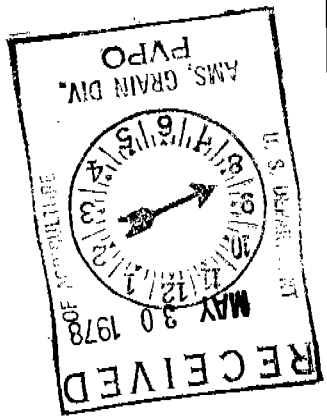
[ ] COLOR: 1 = BRIGHT WHITE 2 = CREAMY, DULL WHITE 3 = PURPLE-GREEN

[ ] SHAPE: 1 = FLAT 2 = SEMI-DOME 3 = DOME

[ ] 1 = NO LEAVES IN CURD 2 = LEAVES IN CURD

7. DISEASE RESISTANCE: (0 = Not Tested; 1 = Susceptible, 2 = Resistant. Specify race if known)

[0]	BLACK SPOT	[0]	CLUBROOT
[0]	PHYTOPHTHORA ROOT ROT	[0]	WHITE BLISTER
[0]	BLACK ROT	[0]	BOTTOM ROT
[0]	CERCOSPORELLA LEAF SPOT	[0]	DOWNY MILDEW
[0]	POWDERY MILDEW	[0]	VERTICILLUM WILT
[0]	BLACK LEG	[0]	CAULIFLOWER MOSAIC
[0]	RING SPOT	[0]	TURNIP YELLOW MOSAIC
[0]	YELLOWS	[0]	WIRE STEM
[0]	OTHER (*Specify*)		



8. OTHER RESISTANCE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

[0]	"BUTTONING"	[0]	"BLINDNESS"
[0]	"RICEYNESS"	[0]	"WHIPTAIL"
[2]	INSECT (*Specify*) Bolting		

9. INDICATE A VARIETY THAT MOST CLOSELY RESEMBLES THAT SUBMITTED: See Attached Pages.

CHARACTER	VARIETY	CHARACTER	VARIETY
MATURITY		PLANT COLOR	
ADAPTATION		CURD SIZE	
PLANT HABIT		CURD SHAPE	
PLANT SIZE		CURD COLOR	

REFERENCE:

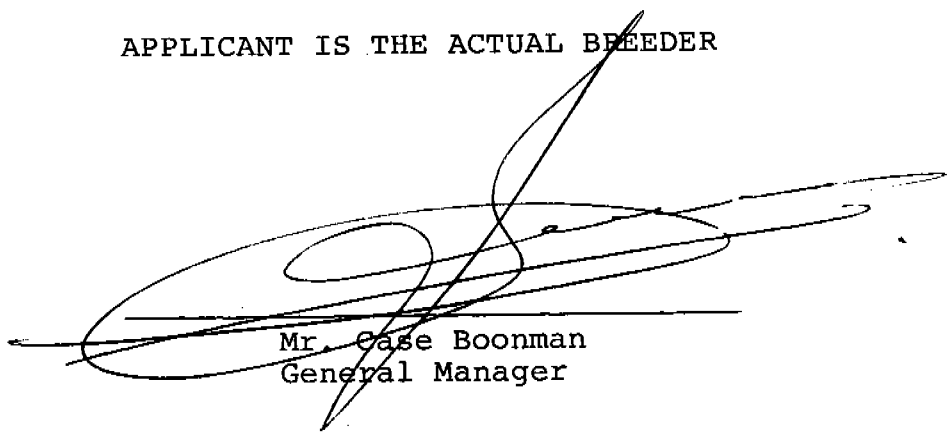
Nieuwhof, M. 1969. Cole Crope – World Crop Series, Leonard Hill.

COMMENTS:

EXHIBIT 13 E

OWNERSHIP STATEMENT

APPLICANT IS THE ACTUAL BREEDER



Mr. Case Boonman
General Manager

May 22, 1978